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The Frow--a Useful Tool

By STEPHEN C. WOLCOTT

Inherited from the Romans, brought to this country by the Jamestown settlers—"to cleave pale" as Capt. John Smith tells us—and by the Plymouth and Salem Colonists to rive out clapboards for shipment to England, the frow, the humblest of all tools, deserves a prominent place in the hall of famous implements.

The records of Massachusetts show that the principal part of most cargoes shipped to England, for many years after 1620, were made up of clapboards, shingles, fence palings, short boards and laths, riven out with this most useful tool. Many of the houses first built by the early settlers were made with vertical poles split in half with the frow. In the colonies, the first roof coverings were slabs,—long riven pieces, some five to ten inches wide, and long enough to cover one side of the roof and allow eight or ten inches for the overhang. In getting out these, as later with shingles, there was left a three-cornered piece which could be used to chink the space between the logs of a log house. It was sometimes erroneously called the shingle bolt. The bolt was really the section of the log from which the shingles were riven, which was also done with the frow. In addition, there were the barrel staves and headings used by the cooper, the spokes and other short pieces necessary to the wheelwright, and drying laths for tobacco.

This useful tool was nothing more than a piece of iron anywhere from four to eighteen inches long, by two to three inches wide, and a quarter to half an inch thick. The lower edge was sharpened. One end of the blade was bent around on itself to form an eye for the handle, which rose eight to ten inches above the unsharpened or driving edge. Holding the handle in the left hand, with the sharp edge on the block or bolt,—as the pieces to be split or riven were called,—the operator struck the upper edge with the frow club until the tool had entered the bolt its full width. If the piece had begun to split, the handle was worked back and forth, with an occasional tap on the end of the frow with the club to encourage its progress.

Our Purpose

The purpose of the association is to encourage the study and better understanding of early American industry, in the home, in the shop, on the farm, and on the sea, and especially to discover, identify, classify, preserve and exhibit obsolete tools, implements, utensils, instruments, vehicles, appliances and mechanical devices used by American craftsmen, farmers, housewives, mariners, professional men and other workers.

Dues

The annual dues are one dollar, payable September first, for the year immediately ensuing.

The Chronicle is sent to all members without additional charge. Back numbers may be secured, when available, by application to the Treasurer, enclosing postage. Our supply of No. 1 is exhausted.

It was the one tool which was always taken along by the pioneer or settler, and the one means of a sure cash crop to the farmer. During the days when farming was out of the question, or when a crop had been laid by and it was too soon to prepare for the next, the frow would come into use, and many shingles be riven out and bundled for market.

The blades varied in length from four inches, for the one used for laths, to the eighteen-inch one used on the big buried cypress logs of Maryland's eastern shore. All but the cooper's frows were straight,—as were some of his,—but he did use a few that were curved, to help in giving his staves the curve so necessary in barrel making.

(*Continued on page 3, column 3*)

Whale Oil Burners

Part II. The Threaded Burner

By EDWARD A. RUSHFORD

Recent research leads to the belief that the term "whale oil burner" has been in use but a comparatively short time,—possibly less than a half-century. At the beginning of the nineteenth century, they were known as "solid burners," so called to distinguish them from the type of burner in which a tubular wick was used, allowing for a central air current. Later, up to the middle of the century, the favorite term for them appears to have been "lamp-cap," and they are so listed in the majority of improvements made on them which are filed in the Patent Office.

Another big step in advance was made when the threaded burner was adapted to glass lamps, for it is supposed that it was used in metal lamps for some time before. While it seems but a simple matter today, some difficulty was encountered in finding a method of securing the collar of the threaded burner, to the neck of the glass lamp. If one happens to possess a lamp, the burner of which has loosened, or if he cares to take the trouble to loosen a burner from such a lamp, he will, in the majority of cases, find two marked points of difference between the necks of the lamps with the threaded burners, and those in which cork disc burners were used. The neck of the former is generally higher than that of the latter, and it is rough finished. This roughness may have been produced in one of two ways, either by chipping the glass after the lamp was made, or by cutting gouges, generally three or four, about the neck. This chipping or gouging of the neck of the lamp intended for a threaded burner, was to furnish a better "footing" for the cement or plaster which was used to secure the burner collar in place. This is an important point in determining the age of lamps found without burners.

The ordinary threaded burners for

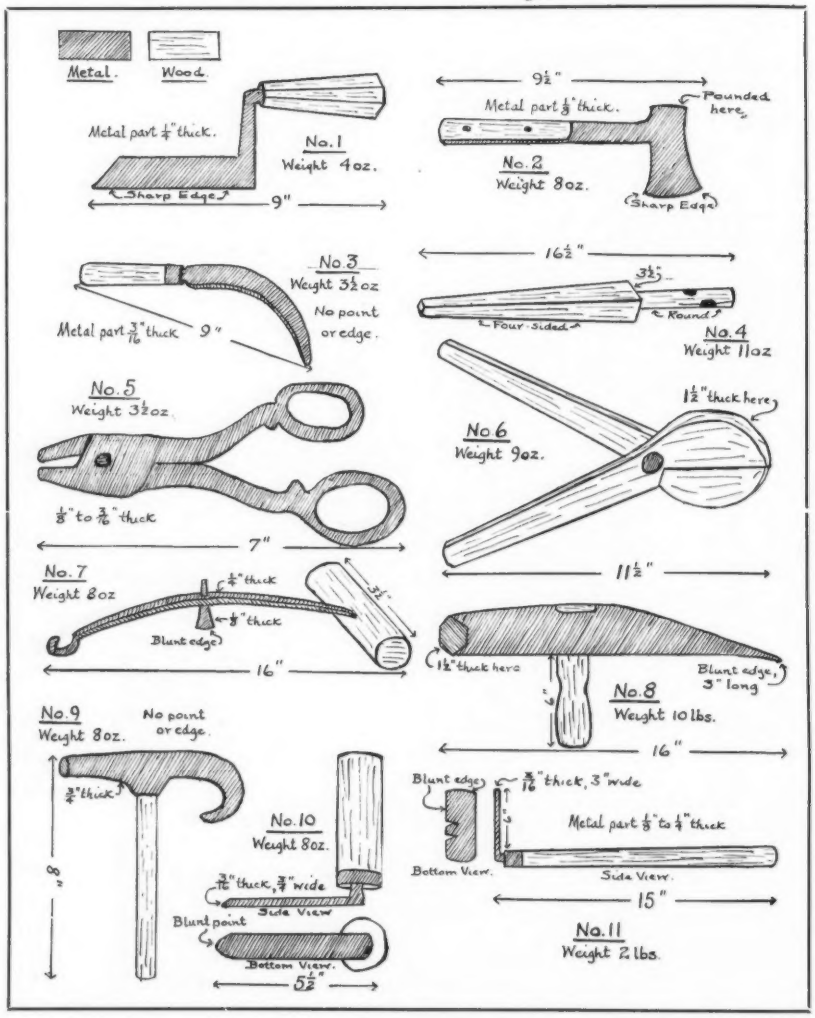
glass lamps were of pewter or brass. They were made in two sections, the collar attached to the lamp and the burner plate supporting the tube or tubes. Both sections were threaded, so that the burner plate could be screwed into the collar. It is not uncommon to find a brass burner plate resting in a pewter collar or *vice versa*, in which case one may be sure that the burner plate is not the original. These burners were made for one or two tubes only, and the rarely found burners with three or four wick tubes were intended to be used with metal lamps. The tubes were made of tin, generally of a heavier grade than those used with the cork disc burner, but fashioned in the same form. They were held in place by a drop of solder on the under side of the plate, or by a sort of solder band completely encircling the tubes. Sometimes an additional drop of solder held the bottom of the tubes together. Except in rare instances, the center of the plate is depressed, forming what was called the "cup," and in it is the usual small opening.

Some have claimed that the age of the burner could be determined by the length of the pick slot, three types of which have been classified. The first group, supposedly the oldest, extend to some distance below the burner plate, the second group extend from the plate upward, while the bottoms of the third group are placed at an appreciable distance above the plate. Examination of a great many burners will lead to the decision that, while this may be true in many instances, it is not an absolutely safe rule to follow.

It has also been claimed that pewter burners are older than those of brass. There is little doubt that pewter was first, and more commonly, used in the making of these burners, but its use did not stop with the adoption of brass for this purpose. The presence of the "solder band," so far noted with pewter burners only, indicates that they were of more recent make than those of less finished construction.

Two variations have been noted in the internal construction of the collar. One of these ends abruptly above the top of the neck of the lamp, while the other extends an appreciable distance down the inside of the neck. Quite a few uncommon forms of solid or whale oil burners have been noted, as well as several patents for improvements in this form of burner, but space does not permit their consideration at this time.

What Are They?



A group of implements thus far unidentified by their owner or by anyone else who has seen his collection. Any information as to their names and uses will be greatly appreciated. The owner has the following comments to offer. (2) The handle consists of two wooden slabs, riveted on either side of the metal part. Much too light for chopping. Possibly edge was placed against the joints of a fowl, and tool pounded, to dismember it. (4) All one piece. Suggests the idea that the tapering four-sided part was for insertion in a square hole, and the tool twisted, to turn the object which had the hole in it, by a stick or handle thrust through one of the holes in the round part of the tool. There is a split running through the upper hole, which probably accounts for the second hole being made. It is splashed with a black substance resembling cobblers' wax. (5) Jaws, ⅛ inch wide, no edge, do not meet when closed. Picks up a plate by the edge very conveniently. (6) Cannot be operated in one hand, as handles are always too far apart. Note thickness of jaws — 1½ inches. (7) Diderot illustrates a similar tool under "Cutler," and an almost identical one under "Spur-maker," calling it *burnisher*. Obviously, hook was intended to engage a ring set in a bench. Curve of tool may be partially or wholly due to accidental bending. (8) Enormously heavy head (nearly 10 lbs.) with very short handle would seem to put this out of the striking class. Blunt edge may have been held in place, and tool pounded on the flat face, but latter shows no evidence of this. (9) Possibly an upholsterer's tool, curved end being used for stretching covering before tacking. (10) Metal part appears almost certainly to be a tine from a spading fork, bent and inserted into the short handle. (11) Possibly a wrecking tool for prying up boards and drawing spikes. [*Ed.*—The cost of this cut (which, incidentally, was furnished to us before Mr. Anderson's services, as draughtsman, became available) was $4.00, which was paid by the owner of the pieces shown. We will be glad, as space permits, to reproduce photographs or sketches of unknown tools, etc., for members who will pay for the cuts,— the size determining the cost. Complete data should be given, as in this case].

Early American Industries Association

Farm Implements of 1824

(*Continued from last issue*)

"When in operation, the teeth run along the ground under the hay, and as they take it up, the upright slats retain it till the rake is full, when the man who holds it turns it over, and thus empties it in a row; then lifts it over the hay thus emptied, and sets it in beyond it; and so on till it is again filled[150]. . . One of the most economical machines (for cutting straw) can be had for $3 or $4[154]. . . A steam-boiler is commonly made by setting a kettle, holding twelve gallons or more, in a furnace, of brick or stone, and over this a hogshead, with one head taken out, and the other bored full of holes, is set so close that the steam of the kettle, when boiling, can only rise through the holes, and then ascend among the articles to be boiled in the hogshead, and pass off at the top. In this way a hogshead full of potatoes will be nearly as soon boiled, as a small part of them only could have been, if placed in the kettle underneath. As the kettle must be so closed as to prevent any steam passing off, but through the bottom of the hogshead or vat, a pipe or tube must be set in one side, through which, with the aid of a funnel, the water is to be poured into the kettle, as often as occasion may require. When poured in, the tube is to be stopped with a plug[155, 156] . . . Tin or wood are the best materials for making butter trays. Some line wooden trays with lead; but this is a bad practice, as lead may sometimes be dissolved by the acid of the milk and then it is poisonous[177, 178]. . . If a pump churn is used, it may be plunged a foot deep in cold water, and remain in that situation during the whole time of churning, which will much harden the butter[178]. . . Wooden vessels are the most proper for containing salted butter, and oak the best kind of wood. Iron hoops should not be used, as the rust of them will in time sink through the wood and injure the butter[179, 180]. . . An improvement in the dasher of the common churn has been made, by which that kind of churn is considered by many to be, for common purposes, equal, if not superior, to any in use. The dasher turns on the handle, by being fixed to it by a pivot. The dasher is merely two cross-pieces, say, three inches square, put together, by being let into each other, which then form four wings. These are cut leveling on each side, at an angle of forty-five degrees, so that they stand diagonally; the whole being very similar to the wings of the little windmills (so called) which are set up, on poles, to be turned by the wind. As this dasher goes down in the milk, it turns one way, on its pivot in the lower end of the handle, and as it comes up, it turns the other way; and this produces an agitation of the milk, better calculated for producing the butter, than any method ever yet known. It is so efficacious in its operation, that the churning must be performed moderately, or the butter will come too soon, and be *swelted*, as it is technically called by some.[180] . . . But let us attend to the best mode of loading our shelves with first-rate cheeses. Make your milk blood-warm, and put in your runnet; but no more than will just make the curd come[181] . . . Stir the curd till it is gathered; put it in a strainer, and with your hands work out all the whey; then lay it in a clean linnen (sic) cloth, put it in the hoop, and, covering it with the cloth, put it in the press, and let it stand there two hours; then take it out, rub it over with fine salt, put it in another dry cloth, and put it in the press again, where it is to remain till the next cheese is ready[181] . . . Wooden vessels are considered most wholesome for holding the milk; but if tin be used, they should be washed every time they are emptied[181] . . . The curd, when formed, is broken with what is called a triple cheese knife (not described)[183]. . .

(*Continued in next issue*)

The Rushlight Club

A meeting was held on June 9th, at the headquarters of the North Andover Historical Society. The lighting devices in the possession of the society were displayed and explained by its vice-president, Mr. L. L. Thwing. A sensation of the occasion was a pewter betty light, a rare item, brought to the meeting by Mr. Arthur L. Hayward. Mr. Julius Daniels read an entertaining essay by Charles Lamb, explaining the origin of roast pig and of lard-burning lamps. President Rushford showed the members a tin nursery lamp, patented in 1812, with an advertisement of it in a contemporary Boston newspaper. According to Dr. Rushford, tin lamps were made in Salem, Mass., as early as 1640, but no United States patent was issued for a lard-burning lamp until 1798. He also demonstrated the use of ancient lamp fuels.

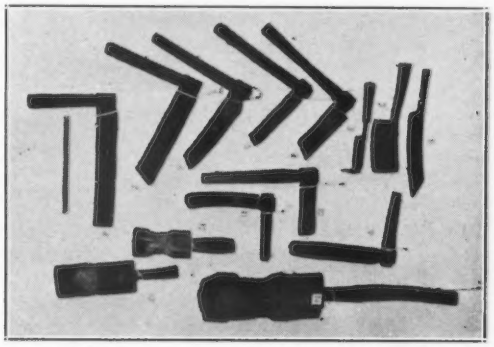
The Frow

(*Continued from page 1, column 2*)

To use the frow, it was necessary to have a club with which to start it and to urge it along. This was always a home-made product. A piece of a branch, or a small tree, not over four inches in diameter, was cut twelve to eighteen inches long, and a handle formed at one end.

Another necessary, but also home-made, assistant to the frow was the frow horse, a Y-shaped branch with each leg four inches or more thick. This was laid with the single leg resting on a log, stump or stone, while the two legs straddled a tree, being held up by two single pieces laid through it at an angle. The chuck or block, from which the shingle was to be cut, was placed between these two legs vertically, with one end resting on the ground. The frow was now started into the top of the block with the club. By working the blade back and forth with the handle and an occasional blow with the club, the thickness of the cut could be accurately controlled. If the operator was seeking slabs, this finished the job, but if shingles were required, they were taken to the shaving horse, where, with a long, heavy draw-knife, they would be thinned on one end and one side for overlapping.

The value of the frow lay in riving or splitting the various pieces along the grain of the wood, thus assuring the strongest form of each piece, at the same time being the easiest and cheapest way of producing them by hand, which, of course, was the only method then used. Orchardists used a small frow for grafting.



Frows and Frow Clubs

Reading from upper right: No. 1, all iron frow for staves; No. 2, cleaver, often used as frow; No. 3, orchardist's grafting frow; Nos. 4, 5, and 6, frows for laths, staves, spokes, etc.; Nos. 7 and 8, shingle and heading frows; *below*, cooper's curved frows; *at bottom*, frow clubs.

Felt Hat Manufacture

By William B. Sprague

(*Continued from last issue*)

(*N. B.— Letters and numerals refer to list of authorities at end of article.*)

Other tools were used to supplement the work of the rounding jack, the *hand jack* (U) being constructed exactly like a plane, with a concave and grooved face, illustration (13a), and the *flanging knife* (U) being a steel knife with no edges at the sides of the blade, but sharpened to a U-shaped point, see illustration (13b).

"Notwithstanding the care that is taken in sorting the down, there are always scattered hairs which become conspicuous at this stage of the manufacture for their harsh and coarse appearance and require to be removed" (C5). This was done with "steel pickers" (E274, F150) or "tweezers" (C5, M36). The illustration (2) shows a pair of tweezers which might well have been, and possibly were, used for this purpose. The two "leaves" are joined only at the narrow end, so that they are normally sprung apart. The concave curve of the tool readily fits in the palm of the hand, and with the thumb against the side of one of the "blades" and the fingers against the other, it is ideally suited for plucking out hairs. However, it carries no history, and was not procured from a hat-making centre, so that its inclusion here is a mere matter of speculation.

So far as the early books are concerned, the description of the hat-making processes closes here with the statement that the trimmings, bindings and linings are sewed on and the hat is finished. Nothing whatever is said about curling the brim or *flanging* — a complicated and interesting process — probably because male hat-wearers were satisfied with flat brims up to about the middle of the century,—and Mr. Moore (U) furnished all the available information on the subject. The tools for this purpose were the *groove tolliker* or *groove*, see illustration (14), the *shackle*, illustration (19), the *foot tolliker* or *foot*, illustration (18), and the *rats*, illustration (20). The early grooves were always of very hard wood, and usually of some choice kind — boxwood, mahogany and even lignum-vitae. Those shown in the illustrations were used about 1850 by Mr. Hoyt (Mr. Moore used metal ones) and were pretty certainly carved out with his own hand, as with them were found a number of unfinished ones in all stages of manufacture. There are fourteen different varieties in the set, for various purposes, but in general, they all have one or more slots, of varying depths, cut into their faces, the edge of the brim being turned over and the slot run over it to produce the required curl, sometimes with one of the rats placed within the fold. Some were for the front and rear of the brim and some for the sides, some for flat curls and some for round ones. The shackle was constructed exactly like a groove tolliker, except that it has a brass plate, loosely screwed to its side, and turned at a right angle under its face. This was also used for curling, and was known in a variety of sizes. The foot tolliker was for raising the curl and smoothing the brim after ironing. The rats were usually of leather or wood, cigar-shaped but bent in a curve, but there were also flat ones of lead, tin, and cardboard. The metal ones were heated for use.

A French encyclopedia of the 18th century (Y) illustrates the bow, the bow pin, the basket, the hardening skin, the walking pin and the glove, much in the same form as they were known here, also, literally translated, "tweezers for removing coarse hairs from furs" and a "piece of copper", apparently the trench or stamper. On the other hand, a recent catalogue from a hatters' supply company shows a "boxwood brim foot tolliker", a "double groove wood tolliker, for medium and wide curls", a "round curl shackle", a "runner-down", a "puller-down" a "slip-stick" and a "rounding-jack", all factory-made of course, but closely following the general lines of their hand-made predecessors.

So much for the tools and methods employed by the early hatters. As to their economic condition, it was mournfully said, a century ago: "The journeyman hatter's earnings are good; but we fear, as in numerous other trades, that his habits are not calculated to induce him to make the most of them." (A172).

Not until the first two instalments of this article were published did the writer learn of a paper on the same subject (Za, below) by Mr. Horace M. Mann, Curator of the Doylestown Museum, which is particularly interesting because most of Mr. Mann's data was procured from the oral statements of retired hat-makers of Danbury and Bethel, Connecticut. This paper is referred to at various points in the latter portion of the article. The following important facts elicited by him pertain to the processes described in the first two instalments.

The curved bridge of the bow was called the *cock*, and the rectangular bridge, the *breech*. The breech was held toward the bower as he worked. After the bowing, the mass of fur was three to four inches deep. The kettle used with the battery was called a *steamboat kettle* or *sizing kettle*. This was "a large copper or brass kettle, permanently erected on a brick or stone flue, with an interior, circular compartment, open at the bottom except for a grate. This compartment is soldered to the bottom of the main kettle and held firm by bars running from the rim of the interior compartment to the rim of the main kettle. In this interior compartment a fire is built of wood, charcoal or soft coal which heats the water contained between this inner compartment and the walls of the main kettle." The battery sometimes had shelves for only four or six workmen, instead of eight. The hatters whom Mr. Mann interviewed did not attempt to join the edges of the batt together on the hurl, but took it to the battery, where they could dip it.

Sources of Information

(A) *Book of English Trades*, published by C. & J. Rivington, London, 1827. (B) *Cabinet of Useful Arts and Manufactures*, published by Caleb Bartlett, New York, 1827. (C) *Cyclopedia of Useful Arts*, by Chas. Tomlinson, published by Virtue & Son, London, 1852, Vol. II. (D) *Handbook of the Useful Arts*, by Thos. Antisell, published by Putnam, New York, 1852. (E) *Book of Trades*, published by Richard Griffin & Co., Glasgow, 1848. (F) *Book of Trades*, published by Tegg & Son, London, 1835. (G) *Dictionary of Arts, Manufactures and Mines*, by Andrew Ure, published by D. Appleton, New York, 1850. (H) *Panorama of Professions and Trades*, by Edward Hazen, published by Uriah Hunt, Philadelphia, 1837. (I) *Scenes of Wealth*, by Isaac Taylor, published by Harris & Son, Hartford, 1826. (J) *American Family Encyclopedia*, by Webster & Parkes, published by Derby & Jackson, New York, 1859 (copyright 1845). (K) *American Mechanical Dictionary*, by Edward H. Knight, published by Ford & Co., New York, 1874. (L) *The Great Industries of the United States*, published by J. B. Burr & Hyde, Hartford, 1873. (M) *A Century of Hats and the Hats of the Century*, by Edward M. Wooley, published by Mallory Hat Co., Danbury, 1923. (N) *The Felt Hat Industry in the United States*, by Edwin M. Benedict, Syracuse University, 1928 (unpublished). (O) *Farmers Mechanic and Cabinet*, July, 1851. (P) *Encyclopedia Brittanica*, 11th Ed., Vol. 13. (Q) *When America was Young*, by John T. Faris, Harper, 1925. (R) *The Industrial History of the United States*, by Louis Ray Wells, Macmillan, 1922. (S) *The Hat in America*, by H. H. Manchester, article in *The American Hatter*, 1926. (T) M. J. Trowbridge, Bethel, Conn. (U) Frank E. Moore, Danbury,

(*Continued on page 7, column 1*)

Early American Industries Association

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W. B. SPRAGUE, *Editor pro tem.*

Editorial

Any tool or implement worth having deserves to have its history recorded. This is often impossible, as when the article has left the hands of its original user and even of his descendants, but frequently a little time spent in asking questions will develop information that will greatly increase the importance of the object and at times give it a personal touch of human interest that will more than repay the trouble taken. So far as possible, whenever we acquire an interesting item, let us make every effort to learn the names of its former owner and of its maker, the approximate date of its manufacture and use, its technical name, and its function and method of use. This is too often neglected, especially by dealers, with the result that these relics are passed on to those who have no way of procuring the information necessary to identify them. We all wish that the early tool-makers had stamped or otherwise marked their products with names and dates, but, in our haste for acquisition and desire to possess, we should not ignore the opportunity to procure this missing data.

— S. C. W.

Stephen C. Wolcott

As already announced in a special notice, mailed to the members, Stephen C. Wolcott, our very highly esteemed Editor and Secretary, died on June 15th. Those who knew him personally, even though their contacts with him were occasional and brief, quickly came to appreciate his fine character and pleasing personality. To them his passing is a very sad event, and, as evidenced by the many letters received from the members, they fully realize how peculiarly well fitted he was for the task which he had undertaken and how much he will be missed. Perhaps no one, since the great Dr. Henry C. Mercer died, has been better equipped than Mr. Wolcott to do effective and important research work on early American industries. Full of enthusiasm, a natural scholar, with endless patience and doggedness, when on the trail of interesting data, and, by no means least important, so situated that he could devote an unlimited amount of time to any quest which he embarked upon, there can be no question that, had he been spared, he would have become a nationally known figure in the field which he had entered. Fortunately we are able to publish one more of his characteristic editorials (immediately preceding this) as well as the well-studied article on The Frow which appears on the front page of this issue. We understood that he had also completed a lengthy article on Cooperage, and we hope to include this, and possibly other writings of his, in future numbers. We are sure that every member will be glad to learn that there is no present intention of dispersing the monumental collection of tools which he had formed.

Annual Meeting

The annual meeting of the Association will be held on September 1st, 1934, at the Northampton Hotel, Northampton, Mass. It will probably help the attendance, if those who have spare room in their cars will offer to transport others who reside in their vicinity. It is hoped that many members will find it possible to arrive the evening before, to have plenty of time to make and renew acquaintances and to view Mr. Wiggins' wonderful collections of household utensils, lighting devices, farm implements and trade tools. Members are encouraged to bring things to trade or sell, and we will trust our dealer friends to keep the commercial feature in the background and let the prospective customer take the initiative. Possibly some arrangement will be made for an open mart or auction, if there seems to be sufficient demand for it. At the business meeting, which will be held at 11 a.m. on Saturday, the 1st, there will be several important matters to dispose of, including the adoption of a permanent code of rules, receiving reports of officers and of chairmen of committees, election of officers for the ensuing year, and, most vital, voting instructions to the officers as to the future publication of *The Chronicle*. We ought to have, from next year's dues, about $250, with which to start the fiscal year. This would be only about enough to pay for three issues, if no more members joined, but it is reasonable to believe that the membership will continue to increase at the past rate of some forty to sixty a month, if everyone helps by asking their friends to join. Several possible courses are open to us. It would undoubtedly be feasible to arrange with some publication in the antique field to set aside a number of pages for our exclusive use, without cost to the Association. Frankly, your officers are opposed to this, except as a last resort. It seems to us that we would immediately lose much of our individuality, and be compelled to forego any hope of becoming a large and useful organization, which eventually must surely come about, if we continue to "go it alone", as successfully as we have during the past year. We could, of course, decide to publish bimonthly instead of monthly, or to print four pages instead of eight, either of which would cut the yearly cost in half. We do not want to increase the dues, unless there is overwhelming sentiment in favor of it. The other way is, for the present, to continue in "hand-to-mouth" fashion, — publishing as frequently as may, in the judgment of the officers, be justified by the influx of new members, always reserving enough in the treasury to "spread" the issues over the year. We are absolutely confident that the monthly schedule of publication can be maintained by this method, if the members will really help with the "missionary work", and we want to know how you feel about it. We hope that all of you, who are within a reasonable distance, will endeavor to attend this meeting. Upon arriving at the hotel, ask for Mr. Wiggins, Mr. Goodnow, or Mr. Sprague, any of whom will see that you are properly looked out for and introduced.

Places to Visit

As promised in our last issue, we present herewith a list of museums which exhibit early American industrial material, and of individual collectors (c) of such material who are willing to exhibit their collections, and of antique dealers (d) who handle such material. *Please note particularly, however, that the individual collections may be inspected only by previous appointment.*

Connecticut

BANTAM (near Litchfield): S. Edson Gage (c).
HARTFORD: Wadsworth Atheneum.
MANSFIELD: Henry W. Knowlton (d).
MORRIS (near Litchfield): William B. Sprague (c), 43 Cedar Street, New York City.
NEW HAVEN: C. E. H. Whitlock (d), 15 Broadway.
RIDGEFIELD: Mrs. Flora H. Haggard (d).
TORRINGTON: F. W. Fuessenich (c and d), P. O. Box 235.

Illinois

CHICAGO: Museum of Science and Industry, Jackson Park.

Maine

BRIDGTON: B. B. Hartford (d).
NAPLES: Mrs. H. A. Soden (d).

Massachusetts

BOSTON: Society for the Preservation of New England Antiquities, 141 Cambridge Street.
CONCORD: Concord Antiquarian Society.
DEERFIELD: Pocumtuck Valley Memorial Association.
DUXBURY: W. C. Sutorious (d).
HADLEY: Old Hadley Farm Museum.
HOLLISTON: Holliston Historical Society.
LEXINGTON: Lexington Historical Society.
MEDWAY: Medway Historical Society.
NANTUCKET: Nantucket Historical Association.
NEW BEDFORD: Old Dartmouth Historical Society, 37 N. Water St.
NORTHAMPTON: Lewis N. Wiggins (c and d), Hotel Northampton.
ORANGE: Mrs. Emma F. Bradford (c and d), 39 West Main Street.
PITTSFIELD: Mr. and Mrs. Edward D. Andrews (c), 42 Clinton Avenue.
PLYMOUTH: Plymouth Antiquarian Society.
SALEM: Essex Institute.
Peabody Museum.
Pioneer Village.
Dr. Edward A. Rushford (c), 184 Lafayette Street.
SOUTHBRIDGE: Albert B. Wells (c).
N.B.—In Mr. Wells' absence inquire for Mr. Blount.
SOUTH HADLEY: Joseph Allen Skinner Museum.
SOUTH SUDBURY: L. P. Goulding (d).
Wayside Inn.
WEST CUMMINGTON: Earle T. Goodnow (d).
Village Studio (d).
WORCESTER: American Steel & Wire Co. Industrial Museum, corner of Grove and Faraday Streets.
Gates and Gates (d), 24 Charlotte Street.
Worcester Historical Society, 39 Salisbury Street.

Michigan

DEARBORN: Edison Institute.
THREE OAKS: Chamberlain Memorial Museum.

New Hampshire

PETERBOROUGH: Stephen Van Rensselaer (d).

New Jersey

SUMMIT: Bird and Elliott (d), Morris Turnpike.
TEANECK: Ye Stepping Stones Shoppe.

New York

ALBANY: New York State Museum.
BROADALPIN: William Rowe (d)
EAST SPRINGFIELD: C. H. Hagadorn (d).
EAST VIEW (Westchester Co.): Hammond House.
NEW YORK: N. Y. Museum of Science and Industry, 220 East 42nd St.
JOHNSTOWN: Johnson Hall.
RIVERDALE (Bronx Co.) Mrs. Elie Nadelman (c).
RIVERHEAD: Suffolk County Historical Society.
TICONDEROGA: Fort Ticonderoga Museum.
UTICA: J. H. Edgette (d), 64 Genesee Street.
WATER MILL (Long Island): Charles B. Foster (c).

Ohio

ASHLAND: Mrs. Rhea M. Knittle (c), 420 Center Street.
ENGLEWOOD: C. Z. Martin (d).
HAYESVILLE: C. A. Jacoby (d).

Pennsylvania

CHADD'S FORD: H. W. Guest (d).
COATESVILLE: Miss Edna Hoffman (d).
DOYLESTOWN: Bucks County Historical Society.
EASTON: Northampton County Historical Society.
GERMANTOWN: Germantown Historical Society, 5214 Germantown Ave.
LANDISVILLE: Landis Valley Museum.
MANHEIM: D. B. Missimer (d).
PHILADELPHIA: Franklin Institute, 15 South 17th Street.
RAUBSVILLE: L. B. Anthony.
READING: Historical Society of Berks County, 940 Centre Avenue.
RED LION: R. T. Knisley (d).
RICHLANDTOWN: R. P. Hommel (c and d).
SELLERSVILLE: Ira S. Reed (d).
SILVERDALE: Levi Yoder (d).
WEST CHESTER: Francis D. Brinton (d).
WYOMING: S. H. Laidacker (d).

Rhode Island

HAMILTON: Gilbert Stuart birthplace.
PAWTUCKET: Slater Mill Museum.
RUMFORD: Mrs. W. H. C. Brand (c), 1609 Pawtucket Avenue.
WICKFORD: South County Museum.

Virginia

LURAY: Dan Holmes (d).
STANLEY: Carlton Finter (c).
TIMBERVILLE: Shenandoah Valley Museum.
WILLIAMSBURG: Colonial Williamsburgh (Rockefeller restoration).
Williamsburgh - Johnstown Museum.

Walter Hough, in his treatise describing the Collection of Heating and Lighting Utensils in the United States National Museum (Smithsonian Institution, United States National Museum, Bulletin 141, Washington, 1928) states that the origin of the two-tube burner is better known than all previous devices using wick-tubes. He stresses the importance of the discovery made by Benjamin Franklin that two-wick tubes ranged side by side, and a certain distance apart, gave a greater amount of light than would be furnished by two single-tube lamps. Encouraged by this performance, one should have expected still greater efficiency from a three-tube lamp, but this scheme, Walter Hough informs us, failed to work. Nevertheless, we are in a position to give a contemporaneous account of a three-tube lamp which Benjamin Franklin used and which was not a failure. Our authority is the Rev. Dr. Jeremy Belknap (1744-1789), the founder of the Massachusetts Historical Society. He had been visiting in Philadelphia, and on November 18th, 1785, wrote a letter from his home in Dover, N. H., to his friend, the Rev. Manasseh Cutler. In regard to the lamp, he relates as follows:

". . . this veteran Philosopher . . . has also a lamp, which, with only three small wicks, gives a luster equal to six candles. A pipe is introduced into the midst, which supplies fresh and cool air to the lights. This might suggest an improvement to the lamps in Light-houses, and perhaps save oil."

Early American Industries Association

New Members

Please check your name and address and advise Mr. Goodnow of any corrections. The total membership is now 268.

Mrs. Fred W. Austin, *So. Weymouth, Mass.*
Mrs. Matthew M. Bagg, *Watertown, N. Y.*
John C. Barnard, *Litchfield, Conn.*
E. K. Davis, Jr., *Phoenixville, Penna.*
Mrs. Josephine J. Dawes, *Hightown, N. J.*
J. Steward Halladay, *Sheffield, Mass.*
Mrs. Flora H. Haggard, *Ridgefield, Conn.*
Trygve Hammer, *Douglaston, N. Y.*
Charles R. Harte, *New Haven, Conn.*
Mrs. J. A. Haskell, *Red Bank, N. J.*
Mrs. Carolyn L. Hawkins, *Freeport, N. Y.*
Rudolph P. Hommel, *Richlandtown, Penna.*
Penrose R. Hoopes, *Philadelphia, Penna.*
Howard G. Hubbard, *South Hadley, Mass.*
Mrs. J. B. Kerfoot, *Freehold, N. J.*
Burton A. Kollmer, *Staten Island, N. Y.*
Mrs. Effie Lamb, *South Hadley, Mass.*
E. E. Langley, *Greenwich, Conn.*
V. K. Melhado, *Bethlehem, Penna.*
John A. Murphy, *Maplewood, N. J.*
James T. Roche, *Fairfield, Conn.*
Hardinge Schoole, *New York, N. Y.*
Mrs. E. B. Sprague, *South Norwalk, Conn.*
William W. Taylor, *Dearborn, Mich.*
Herrel G. Thomas, *Sheffield, Mass.*
William H. Tripp, *New Bedford, Mass.*
William W. Walsh, *Litchfield, Conn.*
Clarence H. Warner, *Sheffield, Mass.*

We also have the following non-member subscribers to *The Chronicle*:

City Library Association, *Springfield, Mass.*
Easton Public Library, *Easton, Penna.*
Holyoke Public Library, *Holyoke, Mass.*
Kent Scientific Museum, *Grand Rapids, Mich.*
Morristown Library, *Morristown, N. J.*
New York Public Library, *New York, N. Y.*
Toledo Public Library, *Toledo, Ohio.*

Felt Hat Manufacture

(*Continued from page* 4, *column* 3)

Conn., an elderly, retired hat-maker, who had learned from his father-in-law, Zerah Hoyt, about the methods employed in the 1840's and 1850's. (V) Mrs. S. E. Downs, Danbury, Conn., whose ancestors were hat-makers and from whom were procured the bow, the basket, the former's trenches, and the napping combs shown in the illustrations. (W) *Five Thousand Receipts in All the Useful and Domestic Arts*, Mackenzie, Kay & Co., Philadelphia and Pittsburgh, 1830. (X) John E. Murray, Bethel, Conn. (Y) *Encyclopedie ou Dictionnaire raisonne des sciences des arts et des metiers*, by Denis Diderot, 1768, see heading "Chapelier". (Z) *Cyclopedia of the Industry of All Nations*, by Charles Knight, published by Knight, London, 1852. (Za) *The Making of Felt Hats*, by Horace M. Mann, Papers of the Bucks County Historical Society, Vol. V.

In the eastern part of the country, the transition from plows with wooden mould boards to those with cast-iron ones took place between 1817 and 1830. In an annual plowing contest, held in Massachusetts, in the former year there were no cast-iron plows, and in the latter year no wooden ones.

Museum Notes

By Professor Joseph W. Roe

The purpose of the New York Museum of Science and Industry is to show the development of applied science and engineering and the vital part they have played and now play in all civilized life. Exhibits are chosen primarily for their educational value. Historical originals are valued over models where they serve this purpose, but a good working model, or replica, would be preferred if it illustrated the principle better than an original. Exhibits are supplemented by charts and diagrams whenever this is desirable.

The Museum is housed in a mid-town office building and has about 30-000 square feet of exhibit space. There are at present eleven sections, covering food, textiles, housing, highway transportation, railways, marine transportation, air transport, communication, machine tools, power, and electro-technology. The exhibits have been carefully chosen to show significant steps in the development of each field. Because of space limitations, the story is in no case complete, but enough is shown to indicate the broad outlines and to suggest the kind of exhibits planned for, when the Museum has ample quarters in its ultimate location.

Wherever possible, exhibits are operatable, preferably by the visitor. If this cannot be done, they are operated by a guide who will make a demonstration. In other cases, their operation is timed automatically to go through the cycle every few minutes. As elsewhere, the most effective exhibits are those where the visitor can operate the exhibit himself.

A certain amount of space is devoted to temporary loan exhibits. There have been a number of these, such as a color show covering the technique of color in the arts and industries, an exhibit of the inventions of Mr. Elmer A. Sperry, and others covering the printing arts, clocks, the early history of aeronautics, etc.

In addition to the exhibits, there is a small auditorium equipped with the most modern projection apparatus, and here, twice a day, at noon and in the mid-afternoon, are given pictures covering scientific and industrial developments. Many of the pictures are tied up with the exhibits, and visitors go out on the floor with quickened interest and a better understanding of the exhibits. The Museum is widely used by the school systems throughout the whole metropolitan section to supplement school work.

The Museum was first opened to the public in 1927 on Fortieth Street, opposite the Public Library. These quarters soon became too small, and in 1930 it moved to the present location in the News Building, 220 East Forty-second Street. With little or no advertising, the attendance has been steadily increasing and is already nearly one-quarter of a million a year, which is more than half that of the Deutsches Museum, and an indication of the rising appreciation by the public of this type of museum. The present location is frankly temporary, and it is hoped that public and private support may soon provide for the Museum a final building adequate in size and character for its growing usefulness.

By Horace M. Mann

The Bucks County Historical Society was organized in 1880 by a few persons interested in preserving the local history of the county. As the society soon began to acquire a collection of historical and archæological specimens, the County Commissioners allowed them the use of a room in the County Court House. Outgrowing this room, they began to look around for larger quarters, and in 1904, the Colonial-type brick building was erected through the generosity of William L. Elkins and his son, George Elkins, of Philadelphia. At first the society only purchased a small corner of the presently owned lot, but an opportunity arising, they purchased the whole tract of over seven acres. All of the collections of the society were displayed in the main room of this building, and in the library wing, until 1916, when the present Mercer Building was completed.

The Mercer Building was built in 1915 and 1916, by Henry C. Mercer, Sc.D., LL.D., a native of Doylestown, and presented by him, together with an endowment to maintain it. This building was built entirely of poured concrete, heavily re-enforced, under Dr. Mercer's personal supervision and from his plans, with concrete roof, floors, window sash, and iron entrance doors to the display rooms and alcoves. At that time it was an almost new method of building construction, using concrete in much the same manner that rammed earth or pise construction had been used in an earlier time. But Dr. Mercer's idea was not so much to demonstrate a new type of building as it was to insure complete protection from fire for the collections he was making, and on which he spent the last thirty years of his life.

INQUIRIES AND REPLIES

(Inquiries and replies are published only if it appears that they will be of general interest to our readers. All other questions will, if possible, be answered direct, but please enclose postage.)

Q. What is a "Dutch oven"? *A.* According to the best authorities, synonomous with "bake kettle," usually cast iron, about a foot in diameter, standing on three legs, the distinctive feature of which is the lid, of which the edge is turned up as much as a full inch, in order to retain the hot coals which were heaped upon it when standing in the embers. The term is also applied — though incorrectly, we believe, — to the brick oven built at the side of the fireplace, and to the hooded "tin kitchen," containing a turnspit, which was stood in front of the fire for roasting purposes.

Q. When was commercial dairying first undertaken in this country? *A.* Up to about 1850, practically all butter and cheese was made on the farms. The first important butter-making establishment was opened in 1861, at which time there were known to be twenty-one cheese factories in operation. Butter-making continued to be almost exclusively a home industry even down to 1880, when only 3½% was commercially produced, but in the same year it is reported that 80% of the total cheese output was from factories.

Q. How can I read up on the manufacture of brooms made of broom corn? *A.* The best treatise we know of is "Broom-Corn and Brooms," written and compiled by the editors of the *American Agriculturist*, originally published in 1876 by Orange Judd Co., New York, but reprinted in 1912, and easily obtainable at a moderate price. Benjamin Franklin is given credit for the introduction of broom corn into this country. Happening to notice a single seed clinging to an imported broom, he picked it off and planted it, and of course, for him, it grew!

"POINTS" OF INTEREST

The crudest, and perhaps the earliest, device for shelling corn in large quantities was a hollowed-out log, about two feet in diameter, open at both ends, with a "grating" about in the middle, consisting of parallel round rods thrust through holes in the sides of the log. An old-timer, who remembers this being occasionally used during his boyhood, states that about a bushel of ears were thrown in and pounded with a pestle made of "iron wood," about as big as a quart can, with a long handle, and the kernels fell down through the grating. The mass of criss-crossed ears acted as a cushion which prevented the grating from being broken by the pestle. The shelled corn was then pounded or ground into coarse meal, which was often used for hasty pudding. Our informant said that his grandfather's name for this was "gape and swaller."

According to Albert H. Sanford's "Story of Agriculture in the United States" (1916), the cradle for reaping grain came into use in this country about 1800, but a wood-cut illustration in a French farming treatise of 1605, shows one of the "hands" using an implement which could hardly be anything else.

The very small powder horn, four or five inches long, is said to have been carried in the pocket, to hold a finer and quicker-acting powder for the firing pan of the flint lock. The smaller grains ran more freely through the hole in the barrel to the charge, and the prompt response of this special powder to the spark from the flint tended to eliminate "hang-fire." Probably these small horns were also used for servicing pistols.

The principal purpose of the "books of trades," published in this country and in England prior to about 1850, was to enable young men, with parental advice, to select the occupations to which they were deemed best adapted, and the literary style employed makes it apparent that they were intended primarily for juvenile edification. For this very reason, and because highly technical phraseology is studiously avoided, the descriptions of the work and methods of the various artisans are all the more intelligible to the present-day reader, and, inasmuch as they deal with contemporaneous matters, can be relied upon for a fair measure of accuracy. They are usually illustrated with crude wood-cuts, which are not sufficiently clear in detail to furnish much valuable information, but which are fascinating by reason of their very quaintness.

ADVERTISEMENTS

Two cents a word (minimum 50c). Count each initial and number as a word. Remittance, payable to E. T. Goodnow, Treasurer, should accompany copy. Where the advertiser's name is not given, address the Editor. Dealers will not be regarded as "commercializing" their memberships by inserting or answering these advertisements.

THE VILLAGE STUDIO, West Cummington, Mass., offers a wide range of books of trades and industries; large assortment of tools and implements to select from; advise us of your interests.

NORMAN GEHRI, ANTIQUES — 180 South Street, Morristown, N. J., showing a collection of carved wooden store signs, and early glassworker's bench with complete set of tools.

WANTED — ANTIQUE FISHING TACKLE of all kinds, rods, reels, hooks, lines, spears, etc. Describe fully, quoting lowest price. John T. Snyder, 100 Broadway, New York.

WANTED — FRAME PIT SAW; hatter's battery; pigeon stool; wool comber's pot; hand forged surgical instruments. W. B. Sprague, 43 Cedar Street, New York City.

THE LATCH STRINGS HANG OUT on Wiggins' Old Tavern and The Old Country Store at Hotel Northampton, Northampton, Mass. "An Inn of Colonial Charm." Antiques — To live among, to eat among, to buy. Lewis N. Wiggins, landlord.

FARM IMPLEMENTS.—On a farm in this vicinity which has remained in the same ownership since Revolutionary times, I offer for sale, at moderate prices, the following early items of farm equipment: revolving hay-rake, fanning mill, hay-cutting box, plow, dog or sheep power, many hand tools and other smaller items too numerous to mention, also early pine corner cupboard still in house. Mrs. R. C. Cummings, 100 Port Watson Street, Cortland, New York.

(If you answer the above advertisement, be sure to mention The Chronicle, as the Association is to receive a commission on all sales through this medium — Ed.)